UNITED STATES ENVIRONMENTAL PROTECTION AGENC
REGION VIII
999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2405

JUL 28 1988

Ref: 8HWM-SR

Ms. Arlene Loble
City Manager
Park City Municipal Corporation
P.O. Box 1480
Park City, Utah 84060

Dear Arlene:

We have completed work on the Ambient Air and Residential Characterization Report for Prospector Square. Our final report, a copy of which is enclosed, presents the background, methods, and results from all sampling conducted by EPA under the approved work plan for this phase of the Prospector Square field work. As you know, the second and remaining phase of the Prospector Square field work, addressing ground and surface water, will be covered in a report to be prepared by the Utah Department of Health.

EPA's enclosed study is the substantial equivalent of a remedial investigation; thus, we are confident in presenting recommendations to you that will prevent human exposure to heavy metals from the tailings in the Park City area. The findings and recommendations contained in this final air and soils report should be read and understood in light of the conclusions reached by the Agency for Toxic Substances and Disease Registry (ATSDR) at the conclusion of its extensive biological monitoring program in the Prospector Square community.

EPA conclusions are as follows:

1. EPA concurs in ATSDR's finding that there is no evidence of exposure to lead, arsenic, or cadmium at levels believed to be harmful among current residents in the study area.

2. There are potential direct contact and ambient air exposures posed by elevated levels of heavy metals in the Park City area. Specifically, our outdoor air study identified elevated levels of chromium, lead, zinc, and other metals in downwind samples compared to upwind samples. Although levels in the downwind samples were elevated, the overall levels of airborne contaminants were quite low and we can conclude that they do not present a public health hazard.

3. Our residential characterization study found the major area of contamination to be in the residential soils. The highest levels of lead, arsenic, and zinc in soil samples were consistently found at Prospector Square residences, the community closest to the exposed tailings. Lead levels were significantly

higher in the residential soils at Prospector Square compared to the other three zones in which samples were collected. It appears that property in Prospector Square that had been effectively covered, however, was within acceptable criteria and showed that additional remediation could solve the problem of direct contact with tailings.

4. Our analyses of residential airborne dust samples found most levels of metals either at or below the detection limit. Further, none of the levels of radon gas detected in the residences sampled was above the EPA action level of 4 picocuries per liter (piC/l).

Thus, the major areas of metals contamination found are the exposed tailings area and some of the residential soils at Prospector Square and in Park City. The major exposure pathway from either of these sources is ingestion. EPA's recommendations for remediation focus on minimizing the exposure of Prospector Square residents to the exposed tailings and to the residential soils.

RECOMMENDATIONS

1. EXPOSED TAILINGS

a) As a temporary measure, the remaining exposed tailings should be covered with at least 6 inches of suitable cover. This will help reduce the exposure to the residents of Prospector Square, particularly those residents who live within 200 feet of the exposed tailings and who would be exposed more frequently and to higher concentrations than would residents who live farther from the tailings.

b) Depending upon the future use of the exposed tailings area, more permanent measures should be considered which would protect the integrity of the cover for the long term. A minimum of 2 feet of suitable cover with grass or native vegetation is recommended to ensure the effectiveness of the cover over the long term. Two feet of soil cover will minimize the concentration of elevated levels of metal contaminants which would be expected near the soil surface as a result of annual plant recycling of soil nutrients. The concentration of metals in the upper soil profile could, if unmitigated, reach toxic levels for plants, thus reducing overall vigor of the vegetation and accelerating the erosion process. An alternative to 2 feet of soil cover would be development of the property in a manner (i.e., buildings and pavement) that would effectively eliminate the potential for exposure from the tailings.

c) Measures such as building codes and safety practices would need to be taken during any construction or disturbance of the tailings area to minimize exposure to the workers or nearby

residents from fugitive dust.
d) Institutional controls are an additional means of ensuring that the integrity of the cover is maintained over the long term. Such controls should include zoning ordinances and/or covenants on the property to ensure that future owners are aware of the importance of maintaining the soil/vegetative cover.

2. RESIDENTIAL SOILS

The high levels of lead, arsenic, manganese, and zinc found in some of the residential soils can not be solely attributed to the levels of airborne contaminants migrating from the exposed tailings. The high level of contaminants in the residential soils is in part due to the tailings material underlying most of Prospector Square. We are concerned that individual landscaping practices may not ensure adequate cover of the tailings material at present or in the future. Activities such as gardening (both vegetable and flower) or the planting of bushes and trees could present a potential exposure pathway to the residents. Other activities that could present a possible exposure pathway to residents include construction, street repair, or utility maintenance.

a) EPA recommends further testing of residential soils to identify those areas with elevated levels of metals. Based on the results of such testing, a number of options may be considered to ensure adequate cover of the tailings. Residences where the yards have already been landscaped may be more limited in the options available.

b) EPA has at its disposal the means of testing the residential soils with a quick turnaround (1 day) time, should the city or residents wish to have further testing done. Additional soil capping efforts are recommended if surface soil samples (upper 1 inch) have lead levels in the range of 1000-2000 ppm (milligrams per kilograms of soil). If the surface soil levels are greater than 2000 ppm in a residential area after capping and other remedial efforts, those efforts are likely to have been ineffective and additional remedial activities are warranted. Additionally, if the soil levels are greater than 2000 ppm, we recommend that a survey of the priority pollutant metals be run and additional risk assessment analysis completed. Testing of soils using X-ray fluorescence scans would be an appropriate technique.

c) Additional soil cover up to 1 foot is recommended where high levels of metals occur in soils that are presently sodded with grass. A soil cover of 6 inches will break the human exposure pathway presented by the residential soils, but 6 inches of soil will not ensure long-term protection. If the grass in a landscaped yard is currently showing signs of stress (not due to a lack of watering or maintenance), the possibility of

insufficient suitable soil cover for the grass roots must be considered. For yards that are not yet landscaped, residents may wish to consider placing up to 2 feet of suitable soil cover over the tailings material. We also recommend the addition of limestone or a similar calcium carbonate enrichment to the soil as a means of minimizing the effects of high metal concentrations.

For those vacant lots that were covered with 6 inches of suitable soil cover under the Special Improvement District authority, EPA considers that measure to be a temporary measure until the lots are developed. EPA assumes that that cover will be maintained. At the time that the lots are developed, measures will need to be taken during construction to minimize exposure to the nearby residents and to the workers. Additional soil cover up to 2 feet on these undeveloped lots should be considered as part of any landscaping effort.

d) Generally, for flower or vegetable gardening, the practice of turning over the soil would not disturb more than 1 foot of cover. However, for trees or bushes, additional soil material is generally excavated during landscaping. Particular care should be taken in digging up tailings material in such locations to ensure that such material is not mixed with suitable soil material or placed at the surface. To ensure healthy trees and bushes, a resident may wish to consider the selection of species with a high tolerance to metals such as lead, cadmium, zinc, or manganese. At the time of planting trees or bushes, the excavation of additional material and replacement with suitable soil material may be desirable to ensure an adequate supply of suitable material for rooting as the plant grows. However, the disposal of this "tailings" material in an appropriate place needs to be assured.

The evaluation for the potential effects of the metals upon plant growth are much more variable. However, the human health criteria will also generally be protective to plants. At this particular site, metals other than lead will likely be the offending agents. Zinc and copper are likely candidates with additional effects expected from the remaining metals. We recommend that, in areas with stressed vegetation after capping or other remedial efforts, additional sampling be conducted. We recommend that the soil samples be composited from the surface to a depth of 24 inches. Testing of the soils using X-ray fluorescence scans would be appropriate.

e) Institutional controls are an additional means of ensuring that the integrity of the cover is maintained over the long term. Such controls should include zoning ordinances and/or covenants on the property to ensure that future owners are aware of the importance of maintaining the soil/vegetative cover.

The above measures are recommended as a means of remediating the resident's exposure to elevated levels of metal contaminants posed by the exposed tailings area and by the residential soils. By covering the exposed tailings and increasing the soil cover of the yards, the potential for exposure through ingestion or inhalation can be significantly reduced. Following implementation of the above recommendations or other measures deemed appropriate, EPA recommends that the City or State conduct additional monitoring to ensure the effectiveness of these measures.

Specifically, we are hopeful that enforceable ordinances or other regulatory mechanisms can be put in place by Park City to ensure the effectiveness and longevity of actions taken to isolate the residents of Prospector Square from the metals of concern. Such ordinances should ensure the protectiveness of the remedial actions taken even as property is transferred over time.

EPA believes that, if Park City and its property owners implement these recommendations, there will be effective remediation to possible exposure to heavy metals found in tailings at and around the Prospector Square area. EPA does not create liability; therefore, we cannot remove liability. However, EPA can state that it sees no impediment to financial transactions involving properties remediated in accordance with the above recommendations.

EPA appreciates your patience throughout the course of our studies and we hope that our recommendations will lead to a more healthy environment for the residents of Park City, Utah.

Sincerely,

Robert L. Duprey, Director
Hazardous Waste Management Division

Enclosure

cc: B. Bradford, UDH

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TO WHOM IT MAY CONCERN:

EPA, in cooperation with the Utah Department of Health and Park City, completed a comprehensive environmental evaluation of mine tailings in the Park City area. These studies were the equivalent of a Superfund Remedial Investigation and, therefore, we are confident in reaching the following conclusions:

1. EPA concurs with ATSDR's finding that there is no evidence of exposure to toxic metals such as lead, arsenic, or cadmium at levels believed to be harmful to current residents.

2. There are potential concerns with metals due to elevated levels in soils should extended exposure occur. However, no air quality or drinking water standards in the area have been exceeded.

3. Property which is effectively covered with top soil and maintained can adequately remediate and solve the potential problem of direct contact with tailings.

4. In our judgment, compliance with the Park City ordinance related to cover where metal levels are elevated can ensure protection of public health.

5. EPA believes that if Park City and its property owners implement EPA recommendations, there will be effective remediation to possible exposure. EPA sees no impediment to financial transactions involving properties that are remediated to prevent such exposure.

Robert L. Duprey, Director
Hazardous Waste Management Division